



MI FluFocus

Influenza Surveillance and Avian Influenza Update

**Bureau of Epidemiology
Bureau of Laboratories**



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New updates in this issue:

- **Michigan:** MDCH reports "No Influenza Activity" to the CDC for MMWR week 19.
 - **National:** Activity continues decreasing; no states reported widespread or regional activity for week 18.
 - **International:** Several countries report high and low pathogenic avian influenza outbreaks in poultry.
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******2009 Influenza A (H1N1) virus Updates******

On April 2, MDCH updated guidance for healthcare providers, local health departments and laboratories regarding influenza surveillance, reporting and testing for the upcoming summer and fall. These documents are now available at the websites listed below.

Please continue to reference the MDCH influenza website at www.michigan.gov/flu for additional 2009 H1N1 information. Local health departments can find guidance documents in the MI-HAN document library. In addition, additional laboratory-specific information is located at the Bureau of Laboratories H1N1 page at http://www.michigan.gov/mdch/0,1607,7-132-2945_5103-213906--,00.html.

******Influenza Surveillance Reports******

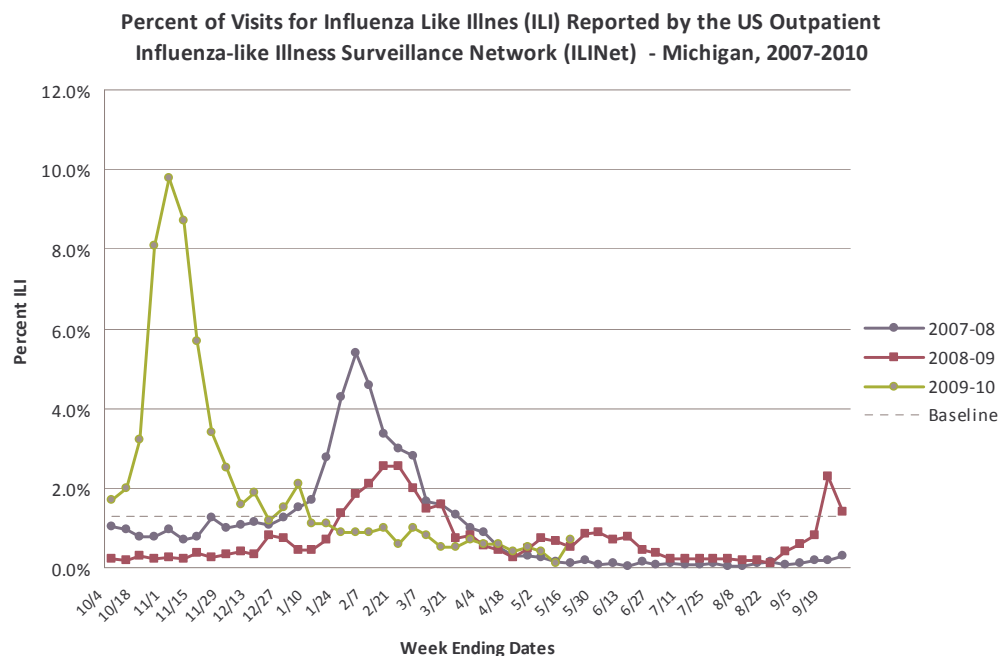
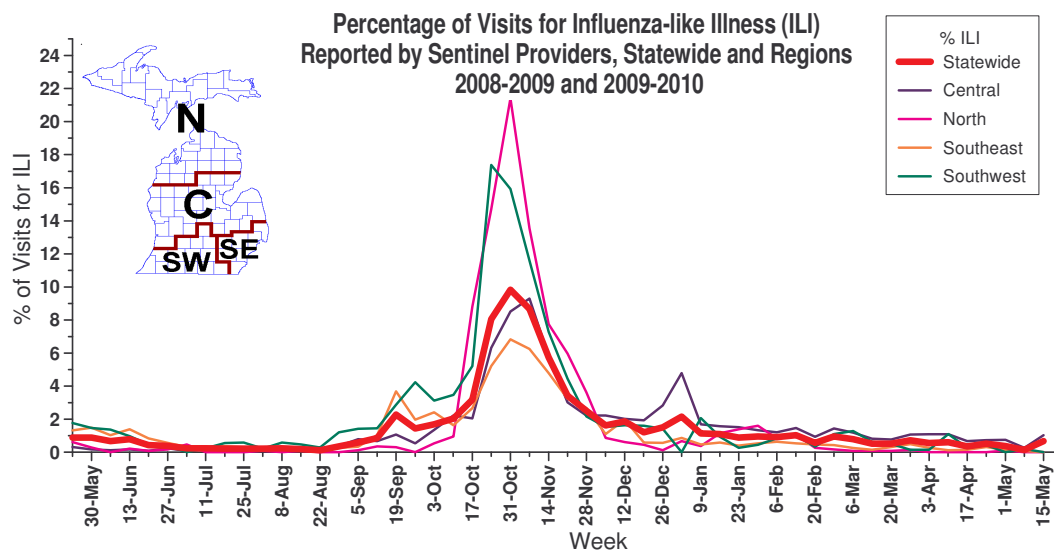
Michigan Disease Surveillance System: MDSS data for the week ending May 15th showed that aggregate influenza, individual influenza, and individual 2009 novel influenza reports remained steady near the previous week's levels. All reported influenza types were slightly lower than the levels reported during the same time last year, which is most likely due to the first wave of 2009 H1N1 influenza that was being seen at this time last year.

Emergency Department Surveillance: Emergency department visits from constitutional and respiratory complaints held steady near the previous week's levels. Constitutional and respiratory complaints were slightly lower compared to the same reporting period last year. In the past week, there were five constitutional alerts in the SW(2), N(1), C(1), and SE(1) Influenza Surveillance Regions and two respiratory alerts in the C(1) and SE(1) Influenza Surveillance Regions.

Over-the-Counter Product Surveillance: Over the past week, all monitored OTC product sales held steady with the previous week's levels except for pediatric electrolytes, which decreased slightly. Thermometer and cough/cold medication sales are consistent with levels seen at this time last year, while chest rub sales are marginally higher and pediatric electrolytes are slightly lower.

Sentinel Provider Surveillance (as of May 20): During the week ending May 15, 2010, the proportion of visits due to influenza-like illness (ILI) increased to 0.7% overall. Thirty-seven patient visits due to ILI were reported out of 5,552 office visits. Twenty-two sentinel sites provided data for this report. Activity increased in one surveillance region: Central (1.0%); decreased to no activity in two surveillance regions: Southwest (0.0%) and Southeast (0.0%); and no activity continued to be reported in the North (0.0%) surveillance region. Please note that these rates may change as additional reports are received.

As part of pandemic influenza surveillance, CDC and MDCH highly encourage year-round participation from all sentinel providers. New practices are encouraged to join the sentinel surveillance program today! Contact Cristi Carlton at 517-335-9104 or CarltonC2@michigan.gov for more information.



Laboratory Surveillance (as of May 15): During May 9-15, MDCH Bureau of Laboratories identified no influenza isolates. For the 2009-2010 season (starting on October 4, 2009), MDCH BOL has identified 610 influenza isolates:

- 2009 Influenza A (H1N1): 609
- Influenza B: 1

Eight sentinel laboratories reported for the week ending May 15, 2010. Two labs reported sporadic influenza A positives (C, N); all others reported no influenza A positives (SE, SW, C). No labs reported any influenza B positives. Four labs reported sporadic RSV positives (SE, SW, C).

Michigan Influenza Antigenic Characterization (as of May 20): One 2009 H1N1 influenza A virus from Michigan has undergone further characterization at the CDC. This virus was characterized as A/California/07/2009 (H1N1)-like, which is the recommended strain for the H1 component of the 2010-11 Northern Hemisphere vaccine.

Michigan Influenza Antiviral Resistance Data (as of May 20): Results are currently not available for antiviral resistance at CDC for the 2009-2010 season.

Antiviral resistance testing takes months to complete and cannot be used to guide individual patient treatment. However, CDC has made recommendations regarding the use of antivirals for treatment and prophylaxis of influenza. The guidance is available at <http://www.cdc.gov/H1N1flu/recommendations.htm>.

Influenza-Associated Pediatric Mortality (as of May 20): Five 2009 H1N1 influenza-associated pediatric mortalities (SE(3), SW, N) have been reported to MDCH for the 2009-2010 influenza season.

***CDC has asked states for information on any pediatric death associated with influenza. This includes not only any pediatric death (<18 years) resulting from a compatible illness with laboratory confirmation of influenza, but also any unexplained pediatric death with evidence of an infectious process. Please immediately call MDCH to ensure proper specimens are obtained. View the complete MDCH protocol online at http://www.michigan.gov/documents/mdch/ME_pediatric_influenza_guidance_v2_214270_7.pdf.

Influenza Congregate Settings Outbreaks (as of May 20): Seven congregate setting outbreaks with confirmatory novel influenza A H1N1 testing (2SE, 3 SW, 1C, 1N), and three outbreaks associated with positive influenza A tests (2C, 1N) have been reported to MDCH for the 2009-2010 influenza season. These are 8 school facilities and 2 long term care facilities. Human metapneumovirus was confirmed in one outbreak in a long term care facility (SW) in February.

During fall 2009, 567 influenza-related school and/or district closures in Michigan (Public Health Preparedness Region 1 - 55, Region 2N - 4, Region 2S - 8, Region 3 - 54, Region 5 - 153, Region 6 - 100, Region 7 - 109, Region 8 - 84) were reported.

National (CDC [edited], May 14): During week 18 (May 2 - 8, 2010), influenza activity decreased in the U.S. 26 (1.5%) specimens tested by U.S. World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) collaborating laboratories and reported to CDC/Influenza Division were positive for influenza. Among 18 subtyped influenza A viruses, 17 were 2009 influenza A (H1N1) and one was influenza A (H3). The proportion of deaths attributed to pneumonia and influenza (P&I) was below the epidemic threshold. No influenza-associated pediatric deaths were reported. The proportion of outpatient visits for influenza-like illness (ILI) was 1.1%, which is below the national baseline of 2.3%. All 10 regions reported ILI below region-specific baseline levels. No states reported widespread or regional influenza activity. One state reported local influenza activity. Guam, Puerto Rico, and 24 states reported sporadic influenza activity. The District of Columbia and 25 states reported no influenza activity, and the U.S. Virgin Islands did not report.

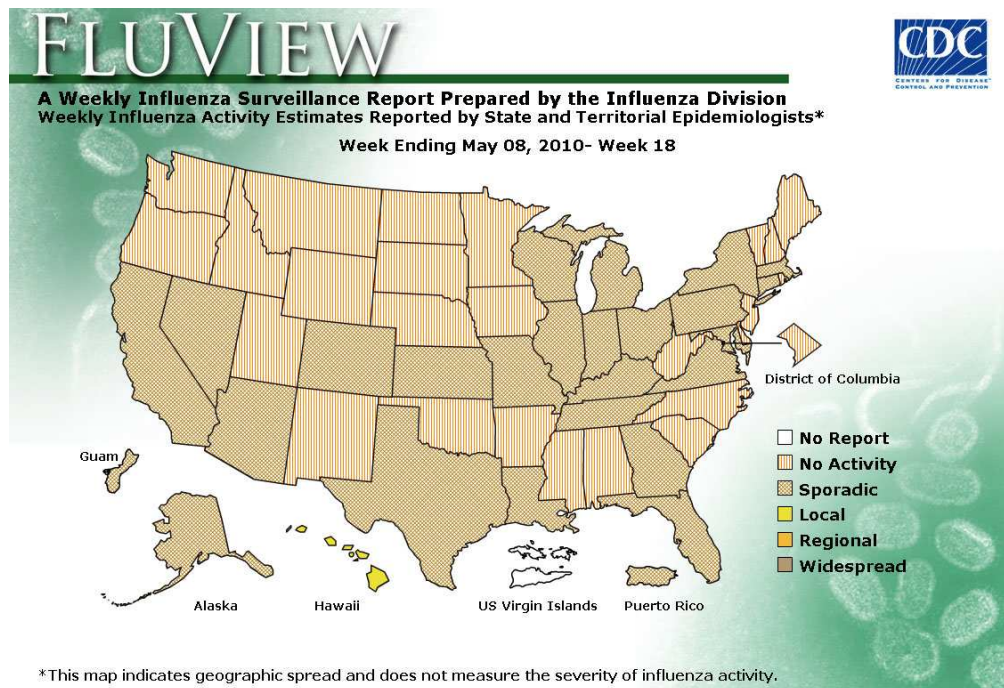
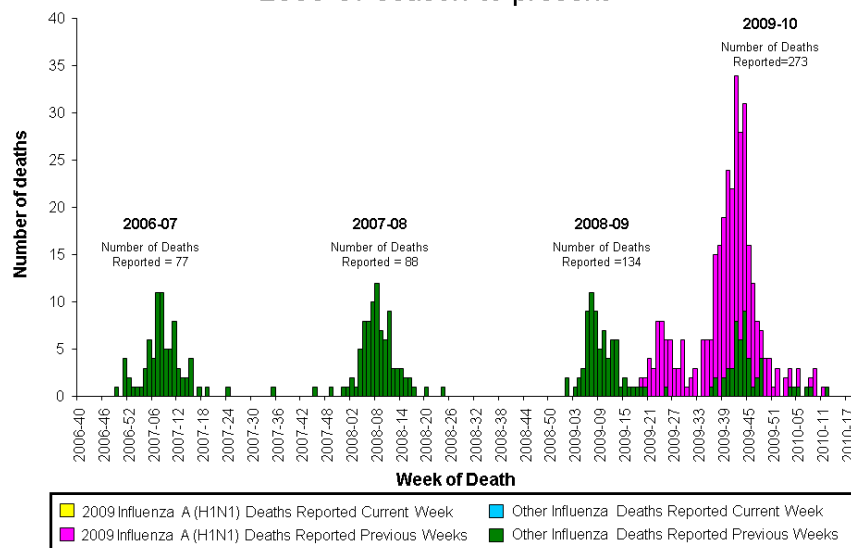
Since August 30, 2009, CDC has received 273 reports of influenza-associated pediatric deaths that occurred during the current influenza season (48 deaths in children less than 2 years old, 30 deaths in children 2-4 years old, 102 deaths in children 5-11 years old, and 93 deaths in children 12-17 years old). Two hundred twenty-two (81%) of the 273 deaths were due to 2009 influenza A (H1N1) virus infections, 50 were associated with an influenza A virus for which the subtype is undetermined, and one was associated with an influenza B virus infection. A total of 282 deaths in children associated with 2009 influenza A (H1N1) virus infection have been reported to CDC.

Among the 273 deaths in children, 146 children had specimens collected for bacterial culture from normally sterile sites and 51 (34.9%) of the 146 were positive; *Streptococcus pneumoniae* was identified in 11 (21.6%) of the 51 children, and *Staphylococcus aureus* was identified in 16 (31.4%) of the 51 children. Four *S. aureus* isolates were sensitive to methicillin, 11 were methicillin resistant, and one did not have sensitivity testing performed. Thirty-four (66.7%) of the 51 children with bacterial coinfections were 5 years of age or older, and 18 (35.3) of the 51 children were 12 years of age or older.

Laboratory-Confirmed Influenza-Associated Pediatric Deaths by Date and Type/Subtype of Influenza

Date	2009 H1N1 Influenza	Influenza A-Subtype Unknown	Seasonal Influenza	Total
Number of Deaths REPORTED for Week 18 (Week ending May 8, 2010)	0	0	0	0
Number of Deaths OCCURRED since August 30, 2009	222	50	1	273
Number of Deaths OCCURRED since April 26, 2009	282	53	3	338

Number of Influenza-Associated Pediatric Deaths by Week of Death: 2006-07 season to present



To access the entire CDC weekly surveillance report, visit <http://www.cdc.gov/flu/weekly/fluactivity.htm>

International (WHO Pandemic update 100 [edited], May 14): The most active areas of pandemic influenza virus transmission currently are in parts of the Caribbean and Central America, and to a lesser extent in West Africa and South and Southeast Asia. In the temperate zone of the northern and southern hemisphere, overall pandemic influenza activity remains sporadic. Seasonal influenza B continues to be detected at low levels across parts of Asia, Africa, and Europe.

In the tropical region of the Americas, pandemic influenza virus transmission remains most active in parts of the Caribbean, and to a lesser extent in Central America. In Cuba, pandemic influenza activity continued to decline after a recent period of intense transmission which began during late February 2010 and may have peaked during late April 2010. Geographically widespread pandemic influenza activity was reported in Jamaica (during much of February through May 2010) and in the Dominican Republic (since late April); however, other respiratory viruses are known to be co-circulating in the region and overall respiratory disease activity during this period was reported to remain low to moderate. The overall SARI [severe acute respiratory infection] rate from sentinel sites in selected Caribbean countries (Dominica and Jamaica) increased since mid April 2010, however, the extent to which this was due circulating pandemic influenza virus versus other respiratory viruses is not known. In Central America and the tropical regions

of South America: Nicaragua, Honduras, Guatemala, Columbia, Bolivia, and Peru all reported regional spread of influenza during one or more weeks since late April 2010 suggesting that low levels of circulating pandemic influenza virus persist in the region. In addition, there is evidence from several countries in this region that there is ongoing co-circulation of influenza with other respiratory viruses (including respiratory syncytial virus (RSV), and adenovirus).

In Asia, the most active areas of pandemic influenza virus transmission currently are in parts of South and Southeast Asia, particularly in Bangladesh, Malaysia, and Singapore. In Bangladesh, a consistently increasing trend of respiratory disease associated with co-circulation of pandemic influenza and influenza B viruses have been reported since mid April 2010; however, the overall intensity of respiratory diseases activity remains low to moderate. In Malaysia, limited data suggest that recent pandemic influenza activity began during early April 2010 and has been stably elevated since mid April 2010. In Singapore, the overall level of ARI remained stably elevated above baseline since early April 2010; 38% of respiratory specimens tested positive for pandemic influenza virus infection during the most recent reporting week. In Thailand, a recent period of sustained transmission of pandemic virus, extending from January until early April 2010, appears to have largely subsided. In India, low levels of pandemic influenza virus continued to be detected in several western and southern states, however, the overall level of respiratory diseases in the population remains low. In Indonesia, a period of low level circulation of seasonal H3N2 viruses which began during early February 2010 now appears to be subsiding. In East Asia, pandemic influenza virus is being detected only sporadically, however, persistent but declining levels of circulating influenza B viruses continued to be reported, particularly in China, Hong Kong SAR (China), and in Chinese Taipei.

In Sub-Saharan Africa, limited data from several countries suggest that active transmission of pandemic influenza virus continues to decline in parts of West Africa, while low levels of influenza B viruses continue to circulate in parts of Central Africa and to a lesser extent in East Africa. In Ghana, pandemic influenza virus detections continued decline after peaking during early April 2010; during the most recent reporting week, 10% of respiratory specimens tested positive for pandemic influenza virus. There was no report of influenza activity in Senegal where a peak of pandemic influenza activity was observed in late February 2010. In central Africa, Cameroon continued to report co-circulation of pandemic and seasonal influenza B viruses; the latter continued to be predominant during the most recent reporting week with approximately 31% of all respiratory samples testing positive for seasonal influenza B and 4% testing positive for pandemic influenza virus. Sporadic detections of seasonal influenza H3N2 and influenza B viruses have been reported across eastern and western Africa over the past month.

In the northern and southern temperate regions of the Americas, only sporadic detections of influenza viruses have been reported, except in Chile, which continued to report localized areas of increased ILI activity associated with co-circulation of pandemic influenza and other respiratory viruses. In Europe, pandemic influenza virus continues to be detected sporadically as the overall intensity of respiratory diseases remained low across the continent. Low level circulation of seasonal influenza B virus persists in parts of southern and eastern Europe, notable in the Russian Federation and in Italy.

MDCH reported **NO INFLUENZA ACTIVITY** to the CDC for the week ending May 15, 2010.

For those interested in additional influenza vaccination and education information, the MDCH *FluBytes* is available at http://www.michigan.gov/mdch/0,1607,7-132-2940_2955_22779_40563-125027--,00.html.

Novel Influenza Activity and Other News

WHO Pandemic Phase: Phase 6 – characterized by increased and sustained transmission in the general population. Human to human transmission of an animal or human-animal influenza reassortant virus has caused sustained community level outbreaks in at least two WHO regions.

National, Research (American Thoracic Society, May 17): Direct Immunofluorescence Assay (DFA) testing for H1N1 influenza ("swine flu") is unreliable in ICU patients, according to a new study from Stanford University. Multiple methods exist for diagnosing influenza, but data on the utility and accuracy of these tests for H1N1 are still emerging, given the relatively recent onset of the epidemic.

"Our findings suggest that in patients with severe H1N1 influenza, in whom rapid and precise diagnosis would be most important, DFA unfortunately does not perform well. This is in contrast to less severely ill patients, where DFA appears to be quite reliable," said Chanu Rhee, M.D., a physician at Stanford University School of Medicine and lead author of the study. The results will be presented at the ATS 2010

While PCR testing has emerged as the most sensitive and specific test for diagnosis of H1N1 influenza, availability of the test and turn-around time often limit its clinical usefulness. DFA testing is used at many institutions as an accurate and rapid means of diagnosing influenza. DFA for influenza uses a fluorescent dye attached to antibodies that bind to flu particles. If influenza is present, the antibodies will bind to viral antigens and a bright glow can be seen in the sample using a special microscope.

Several months after the H1N1 pandemic began, Dr. Rhee and colleagues at Stanford University noticed a trend at their institution that critically ill patients with H1N1 influenza more commonly had negative DFA results than those who were less severely ill. To further investigate this observation, they reviewed the records of all patients who were admitted to the Stanford University Hospital between May 20, 2009 and January 30, 2010 with H1N1 influenza. All patients were confirmed for H1N1 influenza through either PCR or viral culture, and underwent DFA testing on a respiratory tract sample. During the research period, 19 patients were admitted to the ICU; 11 required mechanical ventilation and six died of respiratory failure.

To their surprise, Dr. Rhee and colleagues found that while DFA was a fairly accurate tool for diagnosing H1N1 in non-critical cases, it was not at all accurate for patients in the ICU. Just five of the 19 ICU patients (26 percent) had positive DFAs for H1N1 infection (four by nasopharyngeal swab, one by bronchoalveolar lavage), whereas 27 out of 33 non-ICU patients (82 percent) had a positive DFA test. The median time to first DFA was seven days in the ICU patients and three days in the non-ICU patients. Of the 31 respiratory tract samples in the ICU patients that were positive as determined by PCR, only 10 were concomitantly positive by DFA.

"For the non-ICU patients, the sensitivity of DFA was fairly good and correlated with previously published values. However, we found DFA to be significantly less sensitive in critically ill patients—those with severe respiratory distress requiring mechanical ventilation or a high degree of respiratory support in an ICU setting," said Dr. Rhee. "Interestingly, none of the DFA samples taken from the 18 endotracheal aspirates (secretions taken from the breathing tube on patients on a mechanical ventilator) were positive, despite the presence of virus detected by PCR or by bronchoalveolar lavage."

Dr. Rhee and colleagues were surprised by their findings, as they expected that severely ill patients would have a higher burden of viral disease, leading to easier detection. "We would have also expected that samples taken from endotracheal aspirates, where the secretions are coming from lower down the respiratory tract, would have a higher likelihood of being positive, but this was not the case," said Dr. Rhee.

One possible explanation for the poor performance of DFA in ICU patients is that it is an over-exuberant host inflammatory response, rather than high viral load, that is responsible for severe disease. However, it remains unclear why certain patients develop severe respiratory failure from H1N1 while others with similar risk factors develop only mild symptoms.

If confirmed by further research, these findings have important ramifications. "This study reinforces the fact that patients with suspected H1N1 influenza who are severely ill should be placed in respiratory isolation and receive antiviral treatment without delay, even if DFA testing is negative" said Dr. Rhee. "This includes patients with a negative DFA from lower respiratory tract samples. Furthermore, all critically ill patients with suspected H1N1 should have PCR testing done to confirm the diagnosis, as PCR is significantly more sensitive than DFA, though not perfect either."

"The next logical step would be analyzing data from a much larger pool of patients from different institutions to confirm these findings," said Dr. Rhee.

International, Poultry (OIE [edited], May 14): Highly pathogenic avian influenza virus H5N1; Laos

Date of first confirmation of the event: 06/05/2010; Date of Start of Event: 27/04/2010

Date of report: 14/05/2010; Date Submitted To OIE: 14/05/2010

Province: VIENTIANE CAPITAL; District: Xaythany; Location: Latkhouay

Species: Birds; Susceptible: 1004; Cases: 44; Deaths: 44; Destroyed: 960; Slaughtered: 0

Affected Population: layers

Epidemiological comments: The layers started to show clinical signs on 27 April 2010 and from 28 to 29 April 2010 two layers died. The first two dead poultry were submitted to the National Avian Influenza Laboratory. At the laboratory, necropsy of the two whole carcasses was performed as well as rapid test to detect influenza A and H5; results were slightly positive for avian influenza. Movement control measures

of poultry and poultry products were effective. From 1 to 5 May 2010, the mortality of the poultry increased drastically in the farm and the farmer sent some more whole carcasses to the laboratory. The samples were tested using rapid test and were positive for influenza A and H5. On 6 May 2010, the samples were retested for confirmation using real-time PCR and results were positive for highly pathogenic avian influenza H5N1. Actions for containing the spread of the infection were applied such as culling of infected and potentially infected poultry and disinfection of the premises; both were completed on 7 May 2010. Active and passive surveillances are on-going within 5 km radius around the infected farm. In addition, movement control is also effective.

Source of the outbreak(s) or origin of infection: Unknown or inconclusive

Control Measures Applied: Stamping out, Movement control inside the country, Screening, Zoning, Disinfection of infected premises/establishment(s)

To be applied: No Planned Control Measures; Animals treated: No; Vaccination Prohibited: Yes

International, Poultry (Dutch Ministry of Agriculture press release [edited], May 16): Low pathogenic avian influenza has been detected in a poultry farm with some 28,000 chickens, in Deurne. This mild version hardly makes birds sick and is not dangerous to humans. It is a variant of H7 and not the H5N1 strain, mainly prevalent in Asia, which is dangerous to humans. To be on the safe side, the infected holding will be culled today and precautionary measures undertaken within a zone of about 3 km around the infected farm.

Any transport of poultry and live birds, hatching and table eggs, litter and manure is prohibited from, to and within the zone. All poultry should be kept indoors. The transport of mammals (including cattle, pigs, sheep, goats and horses) is banned as long as such animals originate from poultry-keeping holdings or are intended for entering such holdings. Fairs, markets, exhibitions and other gatherings of poultry or other captive birds are prohibited within the zone. Visitors' entrance into commercial poultry plants is restricted. By commercial companies, the visiting rules are in force.

There are 20 other poultry farms within the said zone. These farms will be screened during the coming days. In addition, premises which may have had contact during the recent period with the infected farm will be investigated.

International, Poultry (OIE [edited], May 21): Low pathogenic avian influenza H7N7; Korea (Rep. of)

Date of first confirmation of the event: 20/05/2010; Date of Start of Event: 13/05/2010

Date of report: 21/05/2010; Date Submitted To OIE: 21/05/2010

Province: CHOLLA-NAMDO; District: Hampyeong-gun; Location: Wolya-myeon

Species: Birds; Susceptible: 12500; Deaths: 0; Destroyed: 12500; Slaughtered: 0

Affected Population: Ducks

Province: CHOLLA-NAMDO; District: Damyang-gun; Location: Bongsan-myeon

Species: Birds; Susceptible: 40800; Deaths: 0; Destroyed: 40800; Slaughtered: 0

Affected Population: Ducks

Epidemiological comments: As part of the avian influenza surveillance programme, Jeollanam-do Institute of Livestock and Veterinary Science took samples (faeces, laryngo-pharyngeal swabs and blood) from the farms on 13 May. Haemagglutination test results were positive on 18 May. The National Veterinary Research and Quarantine Service (NVRQS) found avian influenza antigen (H7) by PCR on 20 May and confirmed it as low pathogenic avian influenza virus (H7N7) by gene sequencing on 21 May. The poultry in the farms were culled as a precautionary measure and disinfection is being implemented on 21 May.

Source of the outbreak(s) or origin of infection: Unknown or inconclusive

Control Measures Applied: Stamping out; Quarantine; Movement control inside the country; Zoning;

Disinfection of infected premises/establishment(s)

To be applied: No Planned Control Measures; Animals treated: No; Vaccination Prohibited: Yes

Michigan Wild Bird Surveillance (USDA, as of May 20): For the 2010 testing season (April 1, 2010-March 31, 2011), highly pathogenic avian influenza subtype H5N1 has not been recovered from 45 samples tested nationwide, including 1 Michigan sample (1 live wild bird). For more information, visit the National HPAI Early Detection Data System at <http://wildlifedisease.nh.gov/ai/>.

To learn about avian influenza surveillance in Michigan wild birds or to report dead waterfowl, go to Michigan's Emerging Disease website at <http://www.michigan.gov/emergingdiseases>.

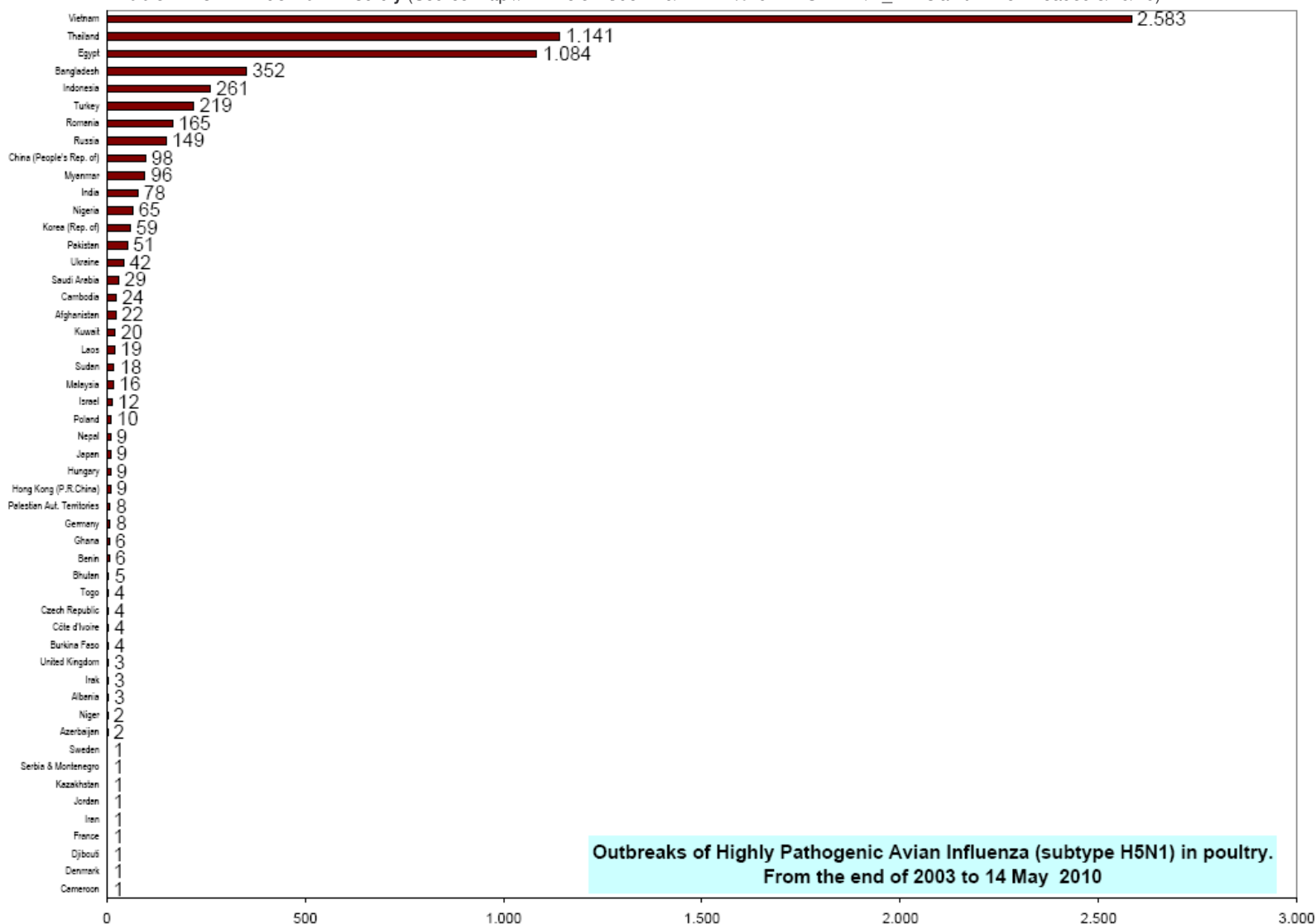
Please contact Susan Peters at PetersS1@Michigan.gov with any questions regarding this newsletter or to be added to the weekly electronic mailing list.

Contributors

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Table 1. H5N1 Influenza in Poultry (Source: http://www.oie.int/downld/AVIAN%20INFLUENZA/A_AI-Asia.htm Downloaded 5/19/10)



**Outbreaks of Highly Pathogenic Avian Influenza (subtype H5N1) in poultry.
From the end of 2003 to 14 May 2010**

Table 2. H5N1 Influenza in Humans - Cases up to May 6, 2010. http://www.who.int/csr/disease/avian_influenza/country/cases_table_2010_05_06/en/index.html. Downloaded 5/10/2010. Cumulative number of lab-confirmed cases reported to WHO. Total cases includes deaths.

Country	2003		2004		2005		2006		2007		2008		2009		2010		Total	
	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths
Azerbaijan	0	0	0	0	0	0	8	5	0	0	0	0	0	0	0	0	8	5
Bangladesh	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Cambodia	0	0	0	0	4	4	2	2	1	1	1	0	1	0	1	1	10	8
China	1	1	0	0	8	5	13	8	5	3	4	4	7	4	0	0	38	25
Djibouti	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Egypt	0	0	0	0	0	0	18	10	25	9	8	4	39	4	19	7	109	34
Indonesia	0	0	0	0	20	13	55	45	42	37	24	20	21	19	3	2	165	136
Iraq	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0	3	2
Lao People's Democratic Republic	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	2	2
Myanmar	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Nigeria	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1
Pakistan	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	3	1
Thailand	0	0	17	12	5	2	3	3	0	0	0	0	0	0	0	0	25	17
Turkey	0	0	0	0	0	0	12	4	0	0	0	0	0	0	0	0	12	4
Viet Nam	3	3	29	20	61	19	0	0	8	5	6	5	5	5	7	2	119	59
Total	4	4	46	32	98	43	115	79	88	59	44	33	73	32	30	12	498	294